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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/622,966	07/18/2003	Michael Stanley DeCourcy	A01398	4021

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ROHM AND HAAS COMPANY
PATENT DEPARTMENT
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EXAMINER

PRICE, CARL D

ART UNIT	PAPER NUMBER
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3749

DATE MAILED: 06/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/622,966

Applicant(s)

DECOURCY ET AL.

Examiner

CARL D. PRICE

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07/18/2003 (preliminary amendment).
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07/18/2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12/19/03; 1/20/04
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the “*shell and tube exchanger comprises a shell portion and a tube portion, and a series of disk-shaped and donut-shaped baffles disposed within the shell and tube exchanger's shell portion, said series of disk-shaped and donut-shaped baffles being configured such that the hot mixed gas alternates across the tubes of said shell and tube exchanger.*” (claims 6 and 7). must be shown or the feature(s) canceled from the claim(s). **No new matter should be entered.**

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 4, 5, 8-10: rejected under 35 U.S.C. 102(b)

Claims 1, 2, 4, 5 and 8-10 are rejected under 35 U.S.C. 102(b) as being anticipated by **US3977832 (SCHOFIELD)**.

US3977832 (SCHOFIELD) discloses a method for reducing the emission of gaseous products into the atmosphere:

“(8) The total effluent from heater 31, in addition to the added steam and products of fuel combustion, will contain oxides of nitrogen (NO.sub.x) which are deleterious both from the standpoint of their effect on the turbine parts as well as their pollution on discharge to the atomsphere. It is therefore common practice to convert these nitrogen oxides to innocuous gas by reduction to elemental nitrogen. Such reductions of NO.sub.x in the gas stream discharged from 31 is carried out by catalytic combustion in a NO.sub.x abatement unit 35, wherein the gas is treated with a suitable reductant, such as natural gas or other hydrocarbon fuel, admitted thereto by line 36.”

The method of **US3977832 (SCHOFIELD)** includes the steps of:

- a. producing a reaction product comprising a hot mixed gas stream (not referenced) by feeding a reaction feed mixture through an inlet of a reaction vessel (20), and passing the reaction product through an outlet of the reaction vessel;
- b. producing a cooled mixed gas stream (at 21, 22 and 23) by directing the hot mixed gas stream through a heat exchanger system;

(In this regard US003977832 (SCHOFIELD) discloses:

“(4) Air stream 14, as illustrated, is subdivided into several branch streams designated 15, 16, and 17, respectively. Stream 15 furnishes the air used in an oxidation of ammonia. Thus, stream 15 is admixed with ammonia introduced by line 18 into catalytic converter 20, in which the initial oxidation takes place over known noble metal catalyst, forming oxides of nitrogen, chiefly NO. The gas stream of reaction products from converter 20 is passed through a waste heat boiler 21 in which the stream is initially cooled, and then through a heat exchanger 22 and cooling condensor 23, for further lowering of the temperature prior to admission of the thus cooled gas stream in absorber tower 24.

(5) Water is admitted to absorber 24 by a supply line 25. As the NO-containing gas stream is successively cooled at 21, 22 and 23 in the presence of excess oxygen, at least the major portion of the NO is converted to NO₂...”)

c. separating the cooled mixed gas stream into a cooled crude product stream (26) and a cooled waste stream (27);

d. producing a preheated waste stream (30) by directing the cooled waste stream through the heat exchanger system (22); and

e. incinerating the preheated waste stream by directing it into an incinerator (35); wherein separation of the cooled mixed gas stream into the cooled crude product stream and the cooled waste stream comprises passing the cooled mixed gas stream into a separator column (24);

wherein the gaseous emissions comprise at least one of the following: nitrogen dioxide, nitric oxide, and carbon monoxide

wherein the preheated waste stream is incinerated through the use of a preheated supplemental fuel and a preheated oxygen-containing stream produced in heater (31).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-5, 8-10: Rejected under 35 U.S.C. 103(a)

Claims 1-5 and 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over the conventional industrial processes disclosed by applicant on pages 1-2 of the specification (Referred to hereinafter as “**Conventional Acrylic Acid Industrial Processes**”) in view of US003977832 (SCHOFIELD).

The **Conventional Acrylic Acid Industrial Processes** disclosed by applicant comprise:

Methods of making products such as acrylic acid from propylene, a reaction feed mixture, typically comprising propylene, oxygen, and optionally water, or nitrogen or other inerts. A two-stage catalytic reactor is typically utilized to oxidize the propylene to acrolein in a first reactive stage, and to then oxidize the acrolein to acrylic acid in a second reactive stage. Conventional two-stage reactors may comprise, for example, a single-shell reactor system (an "SRS"), a tandem reactor system, or a staged-air tandem reactor system, all of which are well known to those skilled in the art.

The output from the catalytic reactor is a hot mixed gas stream comprising acrylic acid, unreacted propylene, nitrogen, and other impurities, such as water, carbon monoxide, carbon dioxide, and acrolein. The hot mixed gas stream passes into a separation step, which serves to separate the acrylic acid from the impurities.

Conventional separation steps typically comprise equipment such as absorbers or extraction columns. The separation step produces at least two streams: a crude product stream comprising primarily acrylic acid, and a waste stream comprising primarily impurities.

The crude product stream is typically further processed to produce product grade acrylic acid or other products, such as acrylic acid esters. The waste stream is typically fed to an incineration step, along with supplemental fuel, such as natural gas, and an oxygen-containing gas stream, such as atmospheric air or oxygen-enriched air. The incineration step typically comprises processing equipment such as thermal oxidizers, incinerators, furnaces, or other combustors suitable for providing high-efficiency destruction of waste streams. In the incineration step, the waste stream is combusted or thermally decomposed to create an effluent stream, comprising inerts - such as water and carbon dioxide - and also thermal NOx. Examples of conventional processes for producing acrylic acid can be found in U.S. Patent Nos. 5,817,865; 6,166, 248; and 6,350,906.

That is, the **Conventional Acrylic Acid Industrial Processes** include the steps of:

- producing a crude acrylic acid comprising a hot mixed gas stream by feeding a reaction feed mixture through an inlet of a reaction vessel, and passing the reaction product through an outlet of the reaction vessel;
- separating the mixed gas stream e.g. – in a separator column) into a crude product stream and a waste stream;
- incinerating the preheated waste stream by directing it into an incinerator along with supplemental fuel and oxygen-containing streams, wherein the gaseous emissions comprise at least one of the following: nitrogen dioxide, nitric oxide, and carbon monoxide.

The **Conventional Acrylic Acid Industrial Processes** disclosed by applicant include the steps of applicant's claimed method with possible exception to:

- producing a cooled mixed gas stream by directing the hot mixed gas stream through a heat exchanger system to form a preheated waste gas stream; and
- "preheated" supplemental fuel.
- "preheated" oxygen-containing stream.

US003977832 (SCHOFIELD) shows and discloses a method for reducing the emission of gaseous products into the atmosphere. See the discussion of **US003977832 (SCHOFIELD)** appearing herein above.

In regard to claims 1-5 and 8-10, for the purpose of reducing the emission of gaseous products into the atmosphere, it would have been obvious to a person having ordinary skill in the art to modify a **Conventional Acrylic Acid Industrial Process** to include a cooled mixed gas stream by directing the hot mixed gas stream through a heat exchanger system to form a preheated waste gas stream and to incinerate the preheated waste gas stream along with a preheated supplemental fuel and a preheated oxygen-containing stream, in view of the teaching of **US003977832 (SCHOFIELD)**.

Claims 6 and 7 are rejected under 35 U.S.C. 103(a)

Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Conventional Acrylic Acid Industrial Processes** in view of **US003977832 (SCHOFIELD)** as applied to claim 1 above, and further in view of **US004230669 (EAGLE et al)**.

The **Conventional Acrylic Acid Industrial Processes** disclosed by applicant include the steps of applicant's claimed method with possible exception to:

- a shell and tube exchanger comprising a shell portion and a tube portion, and a series of disk-shaped and donut-shaped baffles.

US004230669 (EAGLE et al) teaches, form the same industrial processes and heat exchanger field of endeavor as **Conventional Acrylic Acid Industrial Processes and US003977832 (SCHOFIELD)**, using a shell and tube exchanger as a suitable means for transferring useful heat from one process stream to a second process stream.

In regard to claims 6 and 7, for the purpose of providing a suitable means for transferring useful heat from the hot mix process stream to the waste stream, it would have been obvious to a person having ordinary skill in the art to use a shell and tube exchanger, in view of the teaching of **US004230669 (EAGLE et al)**. Furthermore, in order to prevent undesirable solidification of any constituent of the product stream, the hot process stream would necessarily be maintained above the respective constituent's melting points. Thus, as an obvious design expedient, it would have been obvious to a person having ordinary skill in the art to configure the heat exchanger to maintain the respective constituent's of the hot gas stream above their melting points.

Additionally, since the arrangement of a given heat exchanger would necessarily depend on numerous design concerns such as the overall size and shape of the process system components, the type of material being processed or produced, the amount of material being produced, etc. to arrange a series of disk-shaped and donut-shaped baffles disposed within the shell and tube exchanger's shell portion in the manner set forth in applicant's claim 7 can be viewed as nothing more than a mere matter of choice in design absent the showing of any new or unexpected results produced therefrom over the prior art of record.

Conclusion


See the attached USPTO form 892 for prior art made of record, and not relied upon, which is considered pertinent to applicant's disclosure.

USPTO CUSTOMER CONTACT INFORMATION

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CARL D. PRICE whose telephone number is (571) 272-4880. The examiner can normally be reached on Monday through Friday between 6:30am-3:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Monica S. Carter can be reached on (571) 272-4475. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


CARL D. PRICE
Primary Examiner
Art Unit 3749